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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,047	07/24/2003	Yoshikazu Kato	112857-412	4039

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EXAMINER

DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
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1745

MAIL DATE	DELIVERY MODE
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07/17/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/628,047

Applicant(s)

KATO ET AL.

Examiner

Tracy Dove

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-9 and 11-18 is/are pending in the application.
- 4a) Of the above claim(s) 4-8 and 12-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,9,11,17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

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DETAILED ACTION

This Office Action is in response to the communication filed on 5/7/07. Applicant's arguments have been considered, but are not persuasive. Claims 1, 3-9 and 11-18 are pending. Claims 4-8 and 12-16 are withdrawn.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/7/07 has been entered.

Election/Restrictions

Claims 4-8 and 12-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 5/12/06.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 9, 11, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al., US 6,632,566 in view of Marugan et al., US 6,455,202 and/or in view of Yoshino et al., US 5,631,100.

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Yamada teaches a nonaqueous electrolyte secondary battery comprising a positive electrode containing a $\text{Li}_x\text{M}_y\text{PO}_4$ compound (abstract). The $\text{Li}_x\text{M}_y\text{PO}_4$ compound has an olivine structure and M is at least one of 3d transition metals (5:14-20). Yamada teaches a specific example wherein M is Fe (iron) at column 6, lines 5-38. The battery further comprises a negative electrode and electrolyte (4:46-55). As a binder contained in the positive electrode active material, any suitable known resin material, routinely used as a binder for a layer of the positive electrode active material of this sort of nonaqueous battery, may be used (6:41-45).

Yamada does not explicitly teach a binder comprising a rubber latex and a thickener.

However, Marugan teaches a positive electrode for a lithium rechargeable electrochemical cell wherein the electrode comprises a paste containing both an electrochemically active material and a binder (abstract). The binder may comprise an elastomer and a cellulose compound (thickener). The binder may comprise polyacrylic acid (2:39-40). The elastomer is preferably selected from SBR (styrene butadiene rubber) or NBR (synthetic rubber latex adhesive). In a first embodiment, the binder includes a SBR elastomer and a carboxymethylcellulose cellulose compound (3:1-21). The binder contains 30-70% by weight of said cellulose compound relative to the sum of the weight of said elastomer plus the weight of said cellulose compound (3:27-29). Examples 4-6 are analogous to Examples 1-3 with the exception that the binder comprised 2% by weight of NBR in suspension at 41% by weight in water and 2% by weight of salified carboxymethylcellulose in solution at 2% in water. The positive electrode includes 86% of active material, 8% by weight of a carbon-based conductive material and 6% by weight of the binder (8:34-67). The cell includes a negative electrode (3:59-67) and an electrolyte (4:6). The binder is put into solution or suspension in water (2:24-34).

Furthermore, Yoshino teaches a secondary battery comprising a lithium-containing composite metal oxide cathode active material, a negative electrode and an electrolyte (abstract). The cathode active mixture contains 0.1-20 pbw, preferably 0.5-10 pbw of a binder material based on 100 pbw of the electrode active material. The binder preferably comprises a styrene-butadiene latex (7:6-14). When a water-soluble polymer, such as styrene-butadiene latex is used as a binder, a water-soluble thickener may be added as an additive thereto in an amount of 2-60 pbw per 100 pbw of the solid value of the styrene-butadiene latex. Examples of water-soluble thickeners are polyacrylic acid, carboxymethylcellulose and methyl cellulose (8:8-17). The cathode may contain 5 pbw of carbon material (graphite + acetylene black) to 100 pbw of positive active material (Examples). The battery exhibits a high voltage operative at a voltage of from 2.6 to 3.5 V (12:10-40).

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to use the known binder of Marugan or the known binder of Yoshino for the positive electrode binder of Yamada. Yamada teaches as a binder contained in the positive electrode active material, any suitable known resin material, routinely used as a binder for a layer of the positive electrode active material of this sort of nonaqueous battery, may be used (6:41-45). Both Marugan and Yoshino are directed toward nonaqueous batteries with positive electrode binders containing a styrene butadiene latex adhesive and a thickener.

Response to Arguments

Applicant's arguments filed 3/21/07 have been fully considered but they are not persuasive.

Applicant argues Yamada fails to disclose or suggest a binder including about 2-4 wt% of styrene butadiene latex adhesive and about 0.5-2.5 wt% of a thickener. However, this limitation is taught by Marugan and/or Yoshino. See above rejection. Applicant asserts Marugan does not disclose a styrene butadiene elastomer latex. However, Marugan teaches the binder is put into a solution or suspension in water (2:24-34). Marugan clearly teaches a styrene butadiene rubber (SBR) and is not limited to any specific example. Regarding Yoshino, Applicant argues the reference teaches less than 0.1 wt% of latex results in poor adhesion strength. It is unclear how the argument relates to the claimed invention, which recites the binder includes 2-4 wt% of the latex. Yoshino teaches the latex is preferably 0.5-10 wt% of the binder (encompasses claimed range).

Applicant argues Yoshino discloses a thickener can be added at 2-60 wt% per 100 wt% of the solid value of the styrene butadiene latex, which fails to disclose or suggest an about 0.5-2.5 wt% thickener amount in the cathode mixture. It is unclear how Applicant reaches this conclusion. Yoshino teaches the cathode active mixture contains 0.1-20 pbw, preferably 0.5-10 pbw of a binder material based on 100 pbw of the electrode active material. The binder preferably comprises a styrene-butadiene latex (7:6-14). When a water-soluble polymer, such as styrene-butadiene latex is used as a binder, a water-soluble thickener may be added as an additive thereto in an amount of 2-60 pbw per 100 pbw of the solid value of the styrene-butadiene latex. Applicant then asserts even if Yoshino's thickener range encompasses the claimed range, Yoshino still teaches away from the claimed invention. It is unclear how Applicant concludes a prior art reference teaches away from a claimed range when the claimed range is encompassed by the prior art.

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Applicant asserts unexpected results have been demonstrated. However, no evidence of unexpected results has been provided. Applicant has not even stated what unexpected result has asserted by demonstrated.

Applicant argues neither Marugan or Yoshino disclose a lithium iron phosphorous oxide cathode active material having an olivine structure. Applicant further argues Yamada fails to provide a binder that includes a rubber latex adhesive and a thickener. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Applicant has not addressed the Examiner's motivation for combining the references. One of skill would have been motivated to use the known binder of Marugan or the known binder of Yoshino for the positive electrode binder of Yamada. Yamada teaches as a binder contained in the positive electrode active material, any suitable known resin material, routinely used as a binder for a layer of the positive electrode active material of this sort of nonaqueous battery, may be used (6:41-45). Both Marugan and Yoshino are directed toward nonaqueous batteries with positive electrode binders containing rubber latex adhesive and a thickener.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

July 10, 2007


TRACY DOVE
PRIMARY EXAMINER